

BAKER COMMODITIES, INC.
BWP IW 38 PERMIT APPLICATION
TRANSMITTAL NO. W165341
WASTEWATER TREATMENT PROCESS DESCRIPTION

Baker Commodities, Inc. operates a rendering plant in Billerica, MA that takes in about 400 tons per day of grease from restaurants and grease traps, as well as meat by-products from slaughterhouses, restaurants and supermarkets. This material goes through a rendering process that separates moisture from the usable byproducts – tallow, yellow grease and meat and bone meal. Tallow is used to produce soap, lubricants and fatty acids, and yellow grease has many uses ranging from fuel to a feedstock additive. The combination of meat and bone meal is sold as a protein ingredient, largely for chicken feed.

All of the raw material coming into the facility arrives by truck. The main source of wastewater is from the excess water discharged by these trucks to the treatment process prior to unloading the material to be rendered. Other sources of process wastewater are the condensate from the rendering and odor control processes in the rendering area. All of this wastewater requires pretreatment to reduce its organic (biochemical oxygen demand [BOD]) and solids loading and oil and grease concentration prior to discharge to the Billerica Wastewater Treatment Facility (WWTF). The following description discusses the various pretreatment processes in the order of treatment. The attached flow diagram depicts these processes.

Excess water discharged from trucks bringing raw material to the facility is first screened for solids removal. The screening facility is a 2' x 4' sump with 3/8" holes. A 10 horsepower (hp) Hydromatic centrifugal pump with a 3" discharge transfers the screened wastewater to a 12' diameter conical surge tank. The 5000-gallon surge tank is used to equalize and regulate flow using a 3" Hydromatic, centrifugal, 20 hp pump with a variable frequency drive, operating at a flow rate of approximately 40 gallons per minute (gpm).

The water in the surge tank is pumped through a set of three mechanical catch basins or gravity separators piped in series (manufactured by Lane Supply of Brewer, Maine). There are two 6' x 6' x 30' mechanical gravity separators followed by one 6' x 6' x 55' mechanical gravity separator. A cationic polymer is added to the effluent of the third separator before flowing to the dissolved air flotation (DAF) thickeners.

Two DAF thickeners operate in series using air bubbles entrained in the water to float solids, fats, oil and grease to the surface for removal to the rendering plant process. An anionic polymer is added to the influent of the first DAF thickener unit, and may also be added to the second unit. The first thickener is manufactured by Hydro-Cal and is 146" long x 60" high x 60" wide, and the other is a Komline Sanderson unit that is 121" long x 60" high x 71" wide. The thickeners add entrained air to the system by externally mounted regenerative turbine pumps manufactured by Nikuni. There is one 15 hp pump for each thickener, with a capacity of 70 – 80 gpm at a head of 50 – 80 psig.

The underflow from the thickeners flows to a 106" long x 17" wide x 24" deep weir box where it combines with condensate from the rendering and odor abatement operations. The weir box also

provides a sampling point to check water quality. An additive to control foam is supplied at this location using an LMI diaphragm pump with a capacity of 1 gallon per 24 hours. Operators may also add bacterial enzymes to the weir box when needed to enhance BOD reduction. A 2", 15 hp Gould centrifugal pump (with an in-line spare) transfers the water from the weir box to a common lift station where it mixes with water from boiler blow-down and sanitary use. From the lift station the water is pumped to the aeration tanks. The lift station has one Hydromatic centrifugal, 7-½ hp pump with a 3" discharge.

The aeration tanks consist of two 600,000-gallon aboveground tanks, 60' in diameter by 32' high. The normal operating level of these tanks is about 15', which equates to a volume of about 300,000 gallons. Two 100 hp blowers feed 670 fine bubble membrane diffusers to provide aeration to each tank. These tanks are currently operating in series, but may also operate in parallel. The effluent from the tanks flows by gravity to a pump station with one 10 hp Gould centrifugal pump with a maximum flow rate of 150 gpm. This pump transfers the pretreated wastewater via a 4" force main to the Billerica WWTF. Other pipe sizes in the treatment area are mostly 3" or 4".

Immediately downstream of the pump station is a flow meter with totalizer and recorder to monitor the flow to the Billerica WWTF. The flow meter is a Foxboro Integrator magnetic flow meter with a Fischer Porter 7-day chart recorder set up to record flows from 0 – 100 gpm. Composite sampling also occurs at this point to assess compliance of the pretreated wastewater with Town of Billerica local pretreatment limitations for this industry. A timer opens a solenoid valve, and the wastewater sample discharges to a refrigerated container.